

## Graphing: Position v. Time Worksheet

- The graph for questions 1-3 is a DISPLACEMENT graph. We know this because there are negative slopes.

$$\#3 \quad \bar{v} = \frac{\bar{d}}{t} = \frac{\bar{d}_f - \bar{d}_i}{t_f - t_i}$$

f = final

i = initial

- When there is a straight line on a displacement v. time graph, the object is moving at a constant velocity.
- If there is a curve in a displacement v. time graph, this means the object has a changing velocity.

## Acceleration

- Change in velocity
  - Change in magnitude of velocity
  - Change in direction of velocity

• Equation:

$$\overline{a} = \frac{\overline{v}}{t} = \frac{\overline{v}_f - \overline{v}_i}{t_f - t_i}$$

$$\text{Units: } \frac{m}{s^2} \left[ \frac{\text{displacement}}{(\text{time})^2} \right]$$

- Acceleration can:
  - Be a positive number, which means the velocity is increasing
  - Be a negative number, which means the velocity is decreasing.
  - Be equal to  $\emptyset$ , which means object is either not moving or it is moving at a constant velocity.
  - Have a small magnitude, which means that the velocity is changing gradually.
  - Have a large magnitude, which means the velocity is changing rapidly.
- Direction of acceleration:
  - Positive  $\rightarrow$  Velocity is increasing in the positive direction
  - Negative  $\rightarrow$  velocity is decreasing relative to the positive direction  

deceleration